REMARKS

Applicants acknowledge that the outstanding Office Action, dated August 3, 2009, has been made final. Accordingly, a Request for Continued Examination has been submitted herewith, and further consideration of this application, based on the foregoing amendment, and the remarks set forth hereinbelow, is respectfully requested.

Claims 12-15 and 22-28 have been rejected under 35 U.S.C. §103(a) as unpatentable over Rinn et al (U.S. Patent No. 6,045,096) in view of Jaenker (U.S. Patent No. 6,043,587). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims which remain of record in this application distinguish over the cited references, whether considered separately or in combination.

In particular, Applicants respectfully submit that:

- 1. Due to the manner of operation of the variable camber air foil in Rinn et al, a person skilled in the art would find no reason to combine Rinn et al with Jaenker; and
- 2. The incorporation of a piezoelectric actuator in accordance with the teaching of Jaenker would in no way contribute to the operation of the Rinn et al structure, and indeed would impair the operation of that structure.

The present invention is directed to a deformable aerodynamic profiled

member, which comprises (and is bounded by) two "shells", on a pressure side

and on a suction side of the profiled member. According to Claim 12, as

amended, the deformable aerodynamic profiled member according to the

invention has deforming means for varying the curvature of the profiled member

by changing the length of at least one of the shells in a desired direction. In

particular, Claim 12 further specifies that the deforming means comprises at

least one d33 piezo actuator mounted on at least one of the shells. This at least

one piezo actuator is arranged on the shell with an orientation such that a

change of the length of the piezo actuator causes a change of length in the plane

of the shell in the desired direction, and a corresponding deformation of the

profile. Thus, as can be seen, for example, in Figure 1, three piezo actuators 7

are mounted on the upper shell 5 with their axes oriented such that their

expansion in response to the application of a voltage occurs in the direction of the

arrow A. Accordingly, a corresponding deformation of the shell occurs.

The latter features of the invention are recited in Claim 12 as amended,

which includes the following elements:

"deforming means for varying a curvature of said profiled

member by changing length of at least one of said shells in a desired

direction; wherein,

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said deforming means comprising at least one d33 piezo

actuator mounted on said at least one shell; and

said at least one piezo actuator is arranged on said at least

one shell with an orientation such that a change of length of said at least

one piezo actuator causes a change of length in a plane of said at least one

shell in said desired direction, and a corresponding deformation of said

profile, when said at least one actuator is acted upon by electricity."

The latter features are disclosed in the specification in at least paragraph 30,

lines 6-10, and also in paragraphs 10 and 11 on page 3.

The primary Rinn et al patent, on the other hand, operates in a

fundamentally different manner. That is, as can be seen in Figures 3 and 4, and

noted in the Abstract of the Disclosure at lines 2-9, for example, a flexible skin

which substantially encloses the air foil profile in Rinn et al is fixedly coupled to

the trailing portion of the air foil, and is slidable over the structure of the

remainder of the air foil. (See also, Column 3, lines 42-45, and Column 4, lines

27-29.) As discussed in the specification at Column 3, lines 46-65, a pivot bar 38

(Figures 2 and 5), which is not numbered in Figures 3 and 4, can be manipulated

by an operator via an actuator rod 34 to move the trailing edge 46 of the airfoil

assembly downward, as can be seen from a comparison of Figures 3 and 4. (See

Column 3, lines 46-65; Column 4, lines 26-32.)

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Downward movement of the tail section 46 causes the skin to slide over the support structure 22 in a clockwise direction as indicated by the arrows in Figure 3 (Column 4, lines 26-28), causing the support arms 48 to rotate clockwise about fixed pivot points on the support structure. As a result, as can be seen from a careful comparison of Figures 3 and 4, the upper portion of the air foil assembly is pushed outward relative to the support section 22, while the lower portion is pulled toward the support structure 22. Thus, the air foil "bulges" on its upper surface while its lower surface is retracted inwards. Such movements are, as noted, actuated by the downward movement of the trailing edge 46 of the air foil via the pivot bar 38, so that the skin of the air foil slides in the clockwise direction, as noted previously. (See, for example, Column 4, lines 27-37.)

As can be seen from the foregoing brief description, the variable camber air foil disclosed in Rinn et al differs both structurally and operationally from that of the present application. In particular, it does not include any "deforming means" such as recited in Claim 12 which are mounted on one of the shells in such a direction as to impart a deformation force which changes the length of the shell in a desired direction.

The Office Action notes in this regard that Jaenker teaches that d33 piezo actuators can be used to actuate a member. Accepting that proposition as correct for the purpose of discussion, Applicants note that due to the manner of operation of the Rinn et al air foil, the incorporation of piezo actuators to stretch

the skin 20 would provide no useful purpose, and indeed would impair the

operation of the apparatus. That is, the deformation of the air foil in Rinn et al

is achieved by a clockwise sliding of the skin 20 over the supporting structure

illustrated in Figures 3 and 4, due to a downward movement of the trailing edge

46 of the air foil, to which the skin in fixedly coupled. It is apparent that such

operation depends on the proposition that rather than stretching, the skin slides

in the clockwise direction. Assuming that the application of a piezo actuator

such as that of Jaenker et al would stretch the skin, the result would be simply

to generate a slack; it would not cause any sliding movement of the skin, such as

is necessary for the operation in Rinn et al. Indeed, after such stretching,

upward and downward movement of the trailing edge 46 by the actuator rod 34

to effect a change of the camber of the air foil by rotation of the support arms 48

in the manner described previously would be impaired or precluded.

Accordingly, as noted previously, since the addition of a d33 piezo electric

actuator such as disclosed in Jaenker would not contribute in any way to the

operation of the structure in Rinn et al, a person skilled in the art would find no

reason to combine the two. Moreover, for the reasons noted previously, were he

to do so, such a piezo actuator would serve simply to degrade or frustrate

altogether the operation of the variable camber air foil in Rinn et al.

Accordingly, Applicants respectfully submit that the deformable aerodynamic

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profiled member recited and defined in Claim 12 of the present application is not

taught or suggested by the combined teachings of Rinn et al and Jaenker.

In light of the foregoing remarks, this application should be in

consideration for allowance, and early passage of this case to issue is respectfully

requested. If there are any questions regarding this amendment or the

application in general, a telephone call to the undersigned would be appreciated

since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as

a petition for an Extension of Time sufficient to effect a timely response, and

please charge any deficiency in fees or credit any overpayments to Deposit

Account No. 05-1323 (Docket #056226.56477US).

Respectfully submitted,

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